

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
25 November 2004 (25.11.2004)

PCT

(10) International Publication Number
WO 2004/101015 A3

(51) International Patent Classification⁷: **A61B 17/88**

(21) International Application Number:
PCT/US2004/014368

(22) International Filing Date: 7 May 2004 (07.05.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/468,770 7 May 2003 (07.05.2003) US
60/480,057 20 June 2003 (20.06.2003) US
60/503,553 16 September 2003 (16.09.2003) US
60/529,065 12 December 2003 (12.12.2003) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) Date of publication of the international search report:
24 February 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DEVICE FOR TREATING BACK PAIN BY RE-ESTABLISHING THE EXCHANGE OF NUTRIENT & WASTE

(57) Abstract: The intervertebral disc is avascular. With aging, endplates become occluded by calcified layers, and diffusion of nutrients and oxygen into the disc diminishes. The disc degenerates, and pain ensues. Conduits are delivered and deployed into the intervertebral disc to reestablish the exchange of nutrients and waste between the disc and bodily circulation to stop or reverse disc degeneration and relieve pain. The intervertebral disc installed with semi-permeable conduits may be used as an immuno-isolated capsule to encapsulate donor cells capable of biosynthesizing therapeutic molecules. The semi-permeable conduits establish the exchange of nutrients and therapeutic molecules between disc and bodily circulation to treat a disease without using immunosuppressive drugs.

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INTERNATIONAL SEARCH REPORT

US2004/014368

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/88

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
IPC 7 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 586 183 A (PFC SARL ETS) 20 February 1987 (1987-02-20) cited in the application the whole document	1-91
A	DE 44 40 346 A (DAUM GMBH) 15 May 1996 (1996-05-15) cited in the application the whole document	1-91
A	WO 02/17825 A (DISC DYNAMICS INC ; HUDGINS ROBERT GARRYL (US); YUAN HANSEN A (US); BA) 7 March 2002 (2002-03-07) the whole document	1-91
A	US 2001/053914 A1 (HOCHSCHULER STEPHEN H ET AL) 20 December 2001 (2001-12-20) the whole document	1-91

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Date of the actual completion of the international search

22 November 2004

Date of mailing of the international search report

26/11/2004

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INTERNATIONAL SEARCH REPORT

Information on patent family members

US2004/014368

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2586183	A	20-02-1987	FR 2586183 A1	20-02-1987
DE 4440346	A	15-05-1996	DE 4440346 A1	15-05-1996
			AU 3977295 A	06-06-1996
			WO 9614800 A1	23-05-1996
			US 6572593 B1	03-06-2003
WO 0217825	A	07-03-2002	AU 8548601 A	13-03-2002
			CN 1340330 A	20-03-2002
			EP 1313411 A2	28-05-2003
			JP 2004507319 T	11-03-2004
			WO 0217825 A2	07-03-2002
			US 2003195628 A1	16-10-2003
			US 2003220649 A1	27-11-2003
US 2001053914	A1	20-12-2001	US 6447512 B1	10-09-2002
			AU 2767801 A	16-07-2001
			WO 0149188 A1	12-07-2001
			US 2002013588 A1	31-01-2002